

September 2002

Wright Scholar program develops future AF scientists and engineers

by Michael Kelly, AFRL Propulsion Directorate

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — While most of their friends were flipping burgers at the local fast food joint or just hanging out at the mall this summer, a select group of promising young scientists were experimenting with their future as research assistants in the Air Force Research Laboratory at Wright-Patterson Air Force Base.

Twenty-seven “Wright Scholars” joined a team of scientist and engineer mentors in the laboratory’s Propulsion, Air Vehicles and Human Effectiveness Directorates for 10-weeks of hands-on exploration designed to “foster learning in the realm of science and engineering,” said program manager John Horner, propulsion operations division.

The paid internship gave the selectees — from 19 different high schools — an opportunity to assist with on-site research and apply their knowledge of chemistry, physics and mathematics to various types of engineering careers, he said.

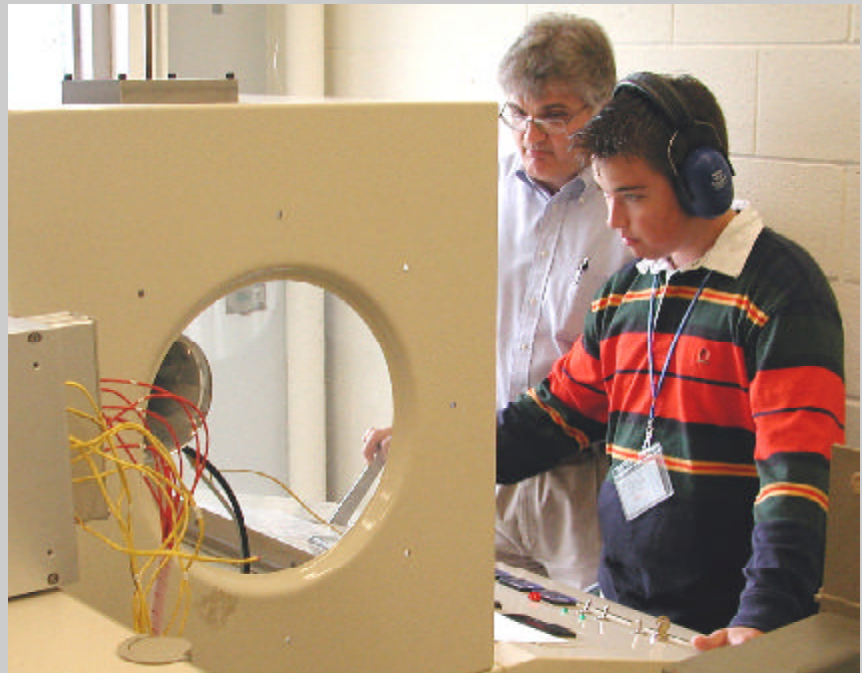
They also participated in a jet engine propulsion course taught at the Air Force Institute of Technology and attended weekly lectures with experts who discussed propulsion and power technologies.

The weekly lecture series was a surprising success, according to Horner.

Topping the list of favorite subjects at the program’s Friday lectures were presentations on pulsed detonation engines, scramjets, optics and lasers, combustion, rockets, and plasma research.

But the program’s biggest payoff, according to Horner — himself a product of an similar internship program more than 30 years ago — was exposing these “enthusiastic and exceptional” students to the wonders of hands-on research.

“I co-op’d in college when I was studying to become a mechanical engineer at the University of Akron and it was a wonderful experience,” he said. “I worked in the B.F. Goodrich re-



Dr. Paul King, associate professor of Aerospace Engineering in AFIT's Graduate School of Engineering and Management, keeps a watchful eye on 17-year-old Casey Holycross as he "runs up" a turbojet engine in a propulsion test cell. King, who has been teaching and researching propulsion systems for 21 years at AFIT and the Air Force Academy, helps his young charge to sense the control of the engine by throttle movement. He typically helps students by monitoring important engine indicators such as rpm, oil pressure and engine temperature. (Air Force photo by Steven Poland)

search lab and factory. I actually designed tires. Through that experience I realized what a valuable program any kind of internship program is, and I tried to develop similar programs in this directorate.”

When given the challenge to establish a work program that would show top high school students what engineering is all about, Horner knew he wanted to give today’s youth the same hands-on experience he benefited from. “We also wanted to give them a chance to explore some of the career opportunities the Air Force has to offer,” he said.

Continued from page 1

For the last 10 weeks, the scientists in training have joined forces with their assigned mentors to conduct individual research projects involving such esoteric issues as three-dimensional modeling of turbine engines, fuel composition analysis and hydrocarbon-fueled supersonic combustion engines. Other topics included studies in jet engine aerodynamics and combustion science.

Ultimately, Horner and his team of scientists and engineers are hopeful that the Wright Scholar program and others like it will generate a pool of highly qualified individuals the Air Force can draw on to fill looming critical shortages of scientists and engineers.

Of the Air Force's 13,300 military and civilian scientist and engineer authorizations, the service is short approximately 2,700 – or about 20 percent, according to Air Force Materiel Command personnel officials. And that's if they only had to fill current vacancies, not expected future shortages.

"We're an aging workforce and a significant number of our scientists and engineers will be eligible for retirement in the next five years," Horner explained. "That's what really motivated us in this program and other summer intern programs.

"We've got some brilliant kids in our local high schools who aren't familiar with the work we do out here. We thought, 'why not look in our own back yard?'" he said.

Senior leadership across AFRL and AFMC has seen the wisdom in that approach to developing the next generation of scientists and engineers and fully support the concept.

"We truly believe that any effort to develop future scientists and engineers will pay big dividends toward our own future, and to that of the Air Force," said Col. Alan Janiszewski, Director of AFRL's Propulsion Directorate.

The command's top engineer agrees.

"It's through the scientist and engineer corps that we sustain what's very important — technological dominance on the battlefield," said James Papa, AFMC engineering and technical management director. "It goes beyond just producing state-of-the-art systems, we need to have a robust scientist and engineer corps to be on the leading edge and stay ahead of our adversaries."

Horner and his team of mentors hope to make that a reality with efforts like the Wright Scholar program.

"You hear all the negatives in the news about our nation's troubled youth. It's refreshing to see these young kids — who essentially are going to play a major role in the workforce over the next 10 years — so intellectually smart and mature at this point in their lives," Horner said.

"I feel like I'm impacting lives," he said. "Hopefully, these kids lives will be changed through this experience — a whole different career path perhaps."

Judging from the number of students eager to return next year, Horner has been able to generate some hope for the command's future S&E workforce.

Twenty of the 22 juniors who participated are returning next year to continue their research and pursue a possible career as an Air Force scientist or engineer. The five seniors going off to college will be invited to apply and take advantage of summer internships in the lab. All are hoping to return, Horner said. @